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The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

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POTATO LATE BLIGHT IN WISCONSIN

On June 7, J. C. Walker telegraphed that late blight lesions on stems and leaves from naturally infected tubers planted on May 1 at Madison, Wisconsin, were collected and positively identified, June 7, by R. H. Larson. The weather throughout the State had been ideal for late blight during the preceding 2 weeks and was still favorable. He added that an intensive survey in central Wisconsin would be started at once.

R. H. Larson, reporting, June 13, the results of a survey in central Wisconsin and the Antigo area on June 8, 9, and 10, stated that positive late blight lesions were found on sprouts in 4 out of 6 cull piles sampled, usually adjacent to large plantings just coming up. The weather still remained ideal for sporulation and spread of the fungus. No natural field infection was found as yet in this area. Weather in the northeastern and north central States during the 2 weeks prior to June 8 is shown on the accompanying 4 maps.

WATCH FOR POTATO LATE BLIGHT

Given the continuance of the essential weather conditions, together with the abundant inoculum resulting from last year's heavy attack and the scarcity of spray materials and of labor, a second outbreak of late blight is so very likely this year that every effort should be made to prevent serious development. Particularly close watch should be kept for the appearance of primary infection and it should be promptly reported when found. Wherever possible, potato cull piles should be destroyed before late blight appears in the fields or gardens, since they furnish the most probable source of primary inoculum, according to Bonde and Schultz's findings in Maine and to Larson's report from Wisconsin given above. When late blight is found in a field the source of inoculum should be determined if possible.

Whether or not late blight proves to be epidemic its development this year will be of unusual interest and should be carefully watched in both commercial fields and home gardens, and fully reported. No opportunity to obtain a reliable quantitative statement of its effect on production should be neglected.

The specifications for ideal estimates of economic loss due to late blight are difficult to fulfil, but the essential requirement is some kind of direct comparison between a blighted field or area and another field free from blight (or a blight-free area of the same field) wherein such factors as variety, soil fertility and general culture are as nearly uniform as possible. A comparison between sprayed and unsprayed, or well-sprayed vs. poorly sprayed, portions of one field would be nearly ideal but such information is seldom obtainable except from experimental plots. Lacking this, the next best thing is any similar comparison in which valid contrasts can be drawn in the opinion of qualified observers who are personally

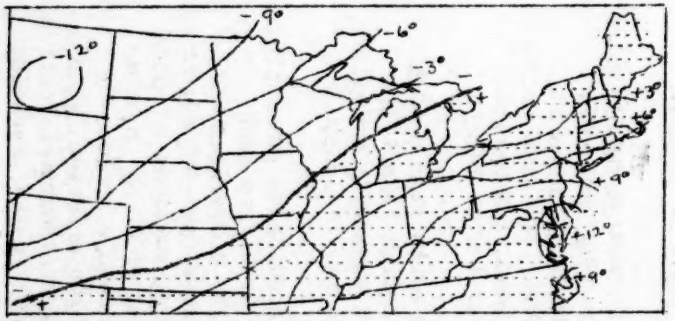


Fig. 1

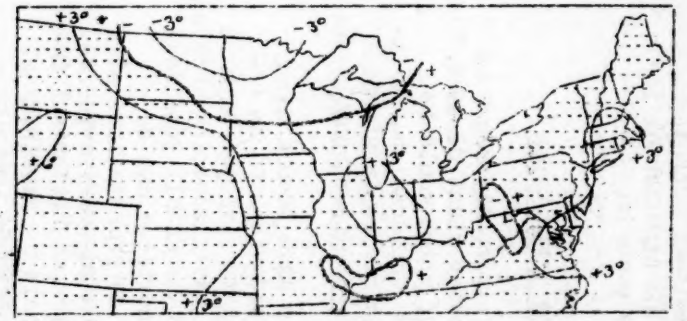


Fig. 2

Shaded portions show excess (+). Unshaded portions show deficiency (-). Lines show amount of excess or deficiency.

Departure of Mean Temperature from the Normal for Weeks Ending 7:30 a.m., June 1 (Fig. 1) and June 8 (Fig. 2), 1943

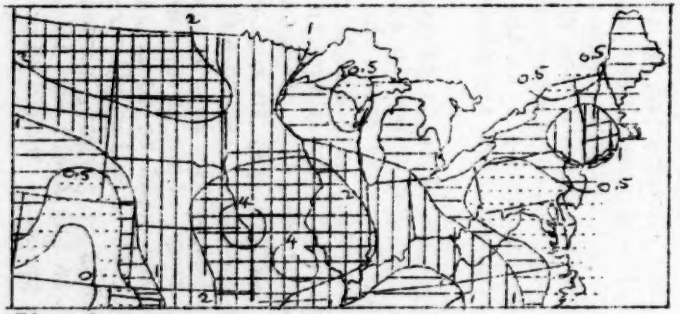


Fig. 3

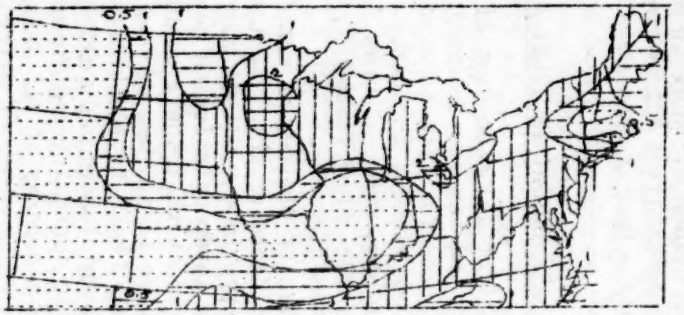


Fig. 4

Unshaded: no measurable rain

0.1 to 0.5 inch

0.5 to 1 inch

1 to 2 inches

Over 2 inches

Total Precipitation, Inches, for Weeks Ending 7:30 a.m., June 1 (Fig. 3) and June 8 (Fig. 4), 1943

familiar with the evidence. Here is where professional pathologists and agricultural specialists like county agents and high school instructors can play a useful role in our crop loss records.

POTATO LATE BLIGHT IN 1942: A REQUEST FOR INFORMATION

Potato late blight and stem rust of cereals are probably regarded with more general and anxious interest than any other plant disease. There are two reasons for this concern, neither of which would be quite so compelling without the other. One is the universal basic importance of the hosts, whose general failure would seriously affect the food supply. The other is the previous record of disastrous losses caused by these two diseases.

Thus, regardless of whether or not it proves to have been a major factor, the coincidence of the 1942 late blight epidemic with an unprecedented shortage in the potato supply is bound to give the disease a prominent place in speculation on causes. When the discussion aroused by the surprising fact that there could be a shortage at all subsides, perhaps the relative importance of the various conditions can be judged more clearly, but the usefulness of future interpretations will depend upon the completeness and reliability of contemporary evidence. Both present public curiosity and future scientific and historical interest demand the recording of all facts that may aid in explanation. Pathologists have their share of obligation to contribute their particular knowledge, and should be especially concerned to appraise the significance of potato diseases in this unusual situation, both in comparison with other factors and by themselves.

From another point of view, however, the potato shortage merely adds one more to the unusual features connected with the 1942 outbreak. Entirely apart from any share of the responsibility for this event, late blight fully maintained its historic reputation. The area suffering heaviest attack extended far to the south and west, and serious loss occurred in regions where the disease had never before been a cause of damage.

The Survey would appreciate it if collaborators would send as full reports as possible on occurrence in 1942. This request is not intended to apply only to areas where the disease was unusually prevalent, but to all States in which late blight can be a source of loss, even though it caused little or no damage in 1942.

Of special interest would be discussion of the conditions permitting the heavy losses, particularly in regions hitherto free from such damage, also, as a matter of record and to facilitate comparison with other years, estimates of the losses caused when these have not already been sent to the Survey. Some statement of the considerations on which the estimate was based would be desirable. The time of first observation and when known its location with respect to probable sources of inoculum, the rapidity of spread, percentage of fields affected, amount of tuber infection in the field and in storage, effectiveness of control, occurrence in home gardens, should also be reported. In the preceding

issue of the Reporter there is given a series of maps combining the monthly temperature and rainfall departures to show both on one chart for each month. It would be of interest to determine whether such maps would be useful in summarizing plant disease occurrence. The dependence of late blight outbreaks on weather may make this disease a good test, although perhaps the maps are not detailed enough for the purpose, either in time or area. It should be noted that the maps compare the weather of each region with its own normal, not with any set standard of temperature or rainfall.

RECENT OBSERVATIONS ON THREADBLIGHT, CORTICIUM STEVENSII, OF TUNG AND SOME NATIVE PLANTS IN THE SOUTHEASTERN UNITED STATES.

John R. Large

Thread blight, Corticium stevensii, is one of the most serious diseases of tung trees. It has been reported on at least 20 southern host plants, including tung at Gainesville, Florida. Prior to 1942 it had been observed on tung at Lamont, Florida, and at Varnado and Isabel, Louisiana. In 1942 it was observed in 4 additional tung orchards, 3 near Bogalusa, Louisiana, and one near White Sand, Jefferson Davis County, Mississippi. Most of the orchards known to be infected are close to swamps. In a survey of one such swamp near White Sand, Mississippi, thread blight infection was found on sweet gum, (Liquidambar styraciflua L.) and black gum, (Nyssa sylvatica Marsh.). In a survey of 2 swamps in Washington Parish, Louisiana, infected plants of these 2 species were again found and in addition infected plants of dogwood, (Cornus florida L.), wild crabapple, (Malus angustifolia (Ait.) Michx.) blackberry, (Rubus sp.), columbine (Aquilegia canadensis L.), American holly (Ilex opaca Ait.), and gallberry or inkberry (Ilex glabra (L.) Gray). Infected native swamp plants probably are the source of inoculum for tung orchards.

Two methods have been used experimentally to control thread blight in infected orchards: (1) sanitation, and (2) spraying. Pruning and burning the diseased shoots at weekly intervals from June to October 1942 held a serious epiphytotic in check in one orchard. Estimates indicated the degree of infection of pruned trees was the same in October 1942 as in June 1942, whereas in untreated trees the degree of infection increased some 500%. It is possible that reinfection from diseased native plants in adjacent swamps prevented complete eradication of the disease.

In 1942, summer sprays of 6-6-100 bordeaux plus 1% summer oil or of 6-2-100 bordeaux reduced the severity and extent of the infection to about one-third that present in October 1941. The most effective time of application appears to be in June, just as the fungus threads emerge from the overwintering sclerotia. Annual spraying of tung orchards is not economically feasible. Eradication must be aimed at and for this purpose one or two summer sprays of 6-2-100 bordeaux mixture, followed

30 days later by a thorough pruning out of any remaining diseased twigs, is recommended.
(DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES)

THE EFFECT OF ROOT KNOT ON FIG SEEDLINGS

A. L. Taylor

The common fig (Ficus carica L.) has often been reported to be heavily attacked and seriously injured by the root-knot nematode (Heterodera marioni (Cornu) Goodey). No cultivated species of Ficus is known to be resistant. Undoubtedly, this pest is an important limiting factor in fig production in the United States. In the hope of finding a root-knot resistant rootstock, a number of fig varieties have been tested at the Georgia Coastal Plain Experiment Station, Tifton, Georgia. Two lots of this material provided an opportunity for observations on the effect of root knot on fig seedlings. So far as the author knows, exact information on this subject is not to be found in the literature.

In 1941, seeds from the Adriatic fig (a horticultural variety of F. carica) fertilized by the Capri fig (F. carica var. sylvestris Nees.) were obtained from Dr. Ira J. Condit, of the University of California. These were germinated in sand and transplanted to 2 sand cultures, one of which had been previously used for root-knot infected tomato plants and the other for uninfected tomato plants. Four months later, 40 representative seedlings from each culture were transferred to a bed of steam-sterilized soil out-of-doors. At this time, the plants from the nematode-infested sand culture had an abundance of the characteristic knots caused by the root-knot nematode and the seedlings from the uninfested culture were free from such knots. Respective average heights of the 2 lots of seedlings were 6.6 and 9.5 cm, the difference being highly significant statistically.

After 4 months in the outdoor bed, all of the infected seedlings but one were dead and this one died shortly thereafter. All of the uninfected seedlings were living and had grown to an average height of 25.7 cm. The results of this experiment leave no doubt that the seedlings had neither resistance nor tolerance to root knot.

A lot of 102 Ficus seedlings of unknown species (S. P. I. Nos. 141138, 141139, 141141, 141143, 141144, and 141147) were obtained through the courtesy of Dr. W. E. Whitehouse, of the Division of Plant Exploration and Introduction. These seedlings were from 30 to 50 cm high when received in March, 1942 and they were immediately planted in random order in a level field known to be free from root knot. None of the trees were infected with this nematode when received. In May, 2 months later, soil from a root-knot infested field was placed around the roots of 52 of the trees. At the beginning of the winter, all of the trees were living and growing more or less normally, though it was noted that the inoculated trees were generally smaller than the corresponding uninoculated ones. In the spring of 1943, all of the uninoculated trees resumed growth, but many of the inoculated ones did not. When examined

on May 8, 1943, 44 of the 52 inoculated trees were dead and the other 8 had a large proportion of dead limbs. Of the 50 uninoculated trees, 44 were growing normally, 4 had a small proportion of dead limbs, and 2 had many dead limbs. All of the inoculated trees had symptoms of severe root knot and root knot was also found on the injured uninoculated trees, the amount being more or less in proportion to the apparent damage. Root knot on the uninoculated trees probably came from accidental inoculation during cultivation or from the small nematode population present when the trees were transplanted. While the apparently uninjured trees were not removed from the soil for examination, some of the roots were uncovered and found to be very lightly infected or free from root knot.

Although a minimum temperature of 15° F (extremely low for Tifton, Ga.) was recorded on Weather Bureau instruments a few hundred yards from the experimental field during the winter, the possibility can be eliminated that the damage observed was due to cold, since the mathematical probability is exceedingly small that 44 out of 52 trees in one group would be killed by cold while 42 out of 50 trees in a similar group would remain uninjured.

The possibility remains that there is some hitherto unsuspected relation between root knot and cold damage, but in the light of the data from the first experiment, this can be dismissed as a bare possibility and not a probability. However, it should be remarked that the death of the trees might easily have been attributed to cold if all of the trees had been placed on heavily infested soil and there had been no opportunity to compare the reactions of the infected and uninfected trees.

(DIVISION OF NEMATOLOGY)

REPORTS ON APPLE SCAB DEVELOPMENT

APPLE SCAB IN RHODE ISLAND: Owing to the continued cold weather during April the development of both apple buds and spore formation in perithecia of Venturia inaequalis was abnormally late. On April 23 buds were in the silver to green tip stages and there was no evidence of spore formation in asci. During the following week apple buds developed to the deleved dormant stage and immature ascospores were seen. By May 1, when McIntosh buds were in preprepink, the fungus had developed quite rapidly in spite of the cool temperatures until 25% to 50% of the asci contained mature ascospores. The table shows the further development of the apple buds and fungus. Although the data does not bring it out clearly, our observations show that in spite of the small amount of precipitation that occurred almost daily during the first 3 weeks in May few or no ascospores were discharged even though they continued to be formed and to mature in the perithecia. The evidence for this is that samples continued to show an increasingly larger number of mature ascospores and no evidence of empty asci. During the rain period of May 17 to 22, while the McIntosh apple trees were in full bloom, approximately 95% of the ascospores were discharged, as shown

Table 1. Development of Apple Scab in Rhode Island - 1943

Date	Bud development (McIntosh)	Ascospore stage	Mean temperature (°F.)	Rainfall inches
May 1	*Preprepink	25% mature	41	.06
2	**		41	
3			46	
4	**Preprepink	50%-75% mature	44	.56
5			52	
6	*Prepink	50% mature	48	.02
7			62	.04
8			64	
9			60	.02
10			52	.08
11	**Pink	50%-75% mature	50	
12			52	1.36
13			56	.04
14	**Late pink	75%-95% mature	51	.10
15			50	
16	*Full bloom		51	
17			62	.04
18	**Bloom	Some discharge	66	.04
19	*Petal fall		62	.18
20			56	.34
21	*Petal fall		56	.50
22			50	.08
23			54	
24	*Calyx	95% discharged	60	
25			56	
26			60	.15
27			68	
28	*Calyx	Over 97% discharged	61	
29			62	Trace
30			58	
31			61	
			Avg. 55	Total 3.61

*Cranston, R. I. **Kingston, R. I.

by the fact that samples taken on May 24 showed not more than 5% mature ascospores. By June 1 very few ascospores could be found in perithecia and conidial lesions were becoming rather common on the underside of McIntosh and Baldwin apple leaves. Also a few black rot(Physalospora obtusa) spots were noted on Baldwin apple leaves on this date.

To summarize: Our observations showed that no fungicide was needed in the delayed dormant spray application in Rhode Island. The ascospores developed within a relatively short period of time during the fore part of May. The primary inoculum was not discharged from the perithecia in spite of almost daily rainfall until the blossom buds were in full bloom. Then at least 95% were discharged within 4 days. Some rain fell on 16 days during May, measuring in the aggregate 3.61 inches. Present indications from unsprayed McIntosh trees are that Apple Scab will be very serious in 1943 unless held in control by fungicides, owing to the quantity and time of discharge of the primary inoculum.

(FRANK L. HOWARD, RHODE ISLAND STATE COLLEGE, JUNE 10)

APPLE SCAB AND BLACK ROT IN OHIO: Recent observations in southeastern Ohio indicate that the black rot organism is causing considerable damage as a result of early leaf spot infection on apple leaves. Defoliation was observed ranging from a trace to 25%. There was a direct correlation between varieties of trees affected with the blossom and twig blight stage of fire blight in 1942 and abundant black rot leaf spots in 1943.

Apple scab is very abundant in unsprayed and poorly sprayed orchards. Even orchardists who have made a special effort to control apple scab are finding it on some varieties through southern and central Ohio. Almost continuous rains through May have favored development of foliage diseases in Ohio.

(C. C. ALLISON, OHIO STATE UNIVERSITY, JUNE 1)

DOWNY MILDEW OF BRIGHT TOBACCO IN VIRGINIA DURING THE 1943 PLANT BED SEASON

Wilbert A. Jenkins

A survey of the downy mildew situation in the bright tobacco belt of Virginia has just been completed. This survey was in the form of questionnaires sent to the County Agents in the flue cured tobacco producing counties of the State. Though the response to these questionnaires was disappointing, enough information was obtained from this method, together with limited personal observations, to enable one to estimate the presence of, and a fairly accurate estimate of percentage losses due to, downy mildew in the State.

Downy mildew was first seen in Pittsylvania County on April 27. According to our survey, its initial appearance in other counties ranged from May 1 through May 17; with an average date of initial appearance for Virginia being about May 5. The disease behaved in a rather peculiar

manner early in the season in that it failed to sweep the beds and then disappear within a reasonable period of time. Instead, areas of varying sizes persisted within the beds and the rate of spread from these areas was often exceedingly slow. Since the plants in general were delayed by low temperature, plants in many beds were just beginning to reach transplanting size when downy mildew became epiphytotic. This situation not only contributed to hazards of plant bed treatment, but influenced numerous growers to attempt transplanting moldy plants to the field.

Individual plant beds sustained losses ranging from negligible to 90%, with the average plant bed loss probably ranging between 25% and 40%. Since it was common knowledge that mold-affected plants were being transplanted to the field, an effort was made to ascertain the percentage of plant losses in the field due to downy mildew. Due to numerous factors over which we had no control, it was impossible to secure an accurate estimate of losses in the field; however, we feel that such losses must have ranged from 15% to 60%. Several growers in various areas reported that they had been forced to replant two to four times. A fairly high loss was also sustained due to the fact that many plants grew beyond transplanting size before growers felt it safe to transplant to the field. In spite of these high losses, with few exceptions, there were adequate plants for a normal crop. Due to retarding effects of the low temperatures early in the season, and the subsequent delay due to downy mildew, the tobacco crop was transplanted to the field some 10 days to 2 weeks later than usual.

Considerable losses were experienced in the southwestern burley producing counties, also, but we have no information on the percentage losses from that area.

In those instances in which control measures were used, P.D.B. was by far the most successful treatment. Considerable difficulty was experienced early in the season with this treatment due to the prevailing high winds. The most successful treatments were obtained by sprinkling the plants in the bed lightly with water, applying P.D.B. at the rate of 1 1/2 lbs. per 100 sq. yds. in the usual manner; then drawing a dry, heavy, cover tightly over the bed. Fermate at the rate of 1 1/2 lbs. per 100 gallons of water gave encouraging results. Although downy mildew appeared late in the beds sprayed with Fermate, it did very little damage.

(VIRGINIA AGRICULTURAL EXPERIMENT STATION)

BRIEF NOTES ON PLANT DISEASES AND A CORRECTION

BACTERIAL WILT OF TOMATO IN TEXAS: Last week, I was called to a tomato field where farmers were unable to name the disease that was killing the plants. Some plants showed only a slight wilting of the upper leaves, and there were intergradations of symptoms becoming more severe, with plants in all stages of wilting, including completely wilted, nearly dead plants. The xylem was browned and blackened in the

bases of the stems. Cut bases of the stems slowly exuded tiny droplets of white-hyaline material, very probably bacterial ooze. These symptoms and signs fit the description of bacterial wilt caused by Bacterium solanacearum. I think that this is the first report of this disease in Cherokee County, Texas. I reported it from a farm near Gladewater a few years ago.
(P. A. Young, Texas Agricultural Experiment Station, Tomato Disease Laboratory, Jacksonville. May 24)

DOWNY MILDEW OF PEAS IN OHIO: Downy mildew [Peronospora pisi] was found in a field of canning peas in Pickaway County, May 21, and in Lawrence County, May 28. (C. C. Allison, Ohio State University. June 1)

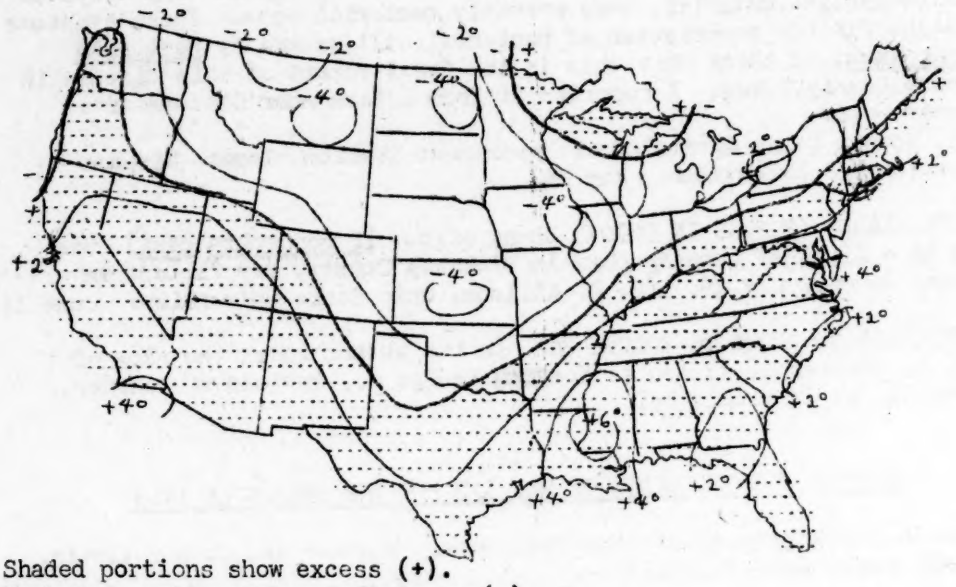
CORRECTION TO INDEX TO VOLUME 26: In the author index the name of Dr. G. R. Hoerner is listed as Hoerner, George R., instead of Hoerner, Godfrey R., as it should be.

WEATHER FOR THE MONTH OF MAY AND FOR THE SPRING OF 1943

(From U. S. Department of Commerce, Weekly Weather and Crop Bulletin, for week ending June 8, 1942)

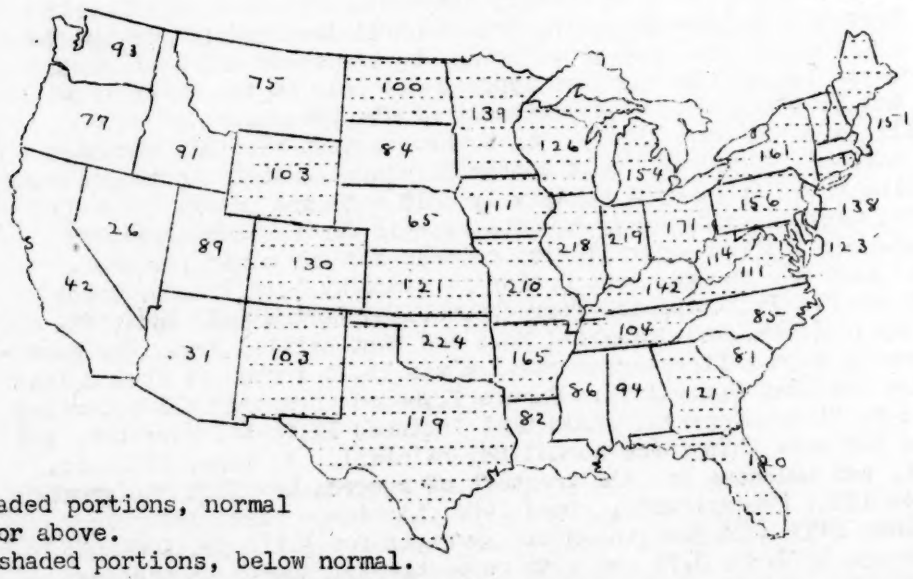
MAY WEATHER: The outstanding features of the weather of May 1943 were the persistent coolness in the Northwest and North-Central States, seasonal to considerably above normal temperatures in the East and South, and unprecedently heavy rainfall in most interior valley areas. Figure 1 shows that the mean monthly temperature was subnormal north and northwest of a line extending from central New England southwestward to northern Texas, and above normal to the south and southeast. This general temperature pattern applies not only to the month as a whole, but it persisted throughout most of the period.

It will be noted from Figure 2 that the heaviest rainfall occurred over a northeast-southwest belt centering almost exactly on the temperature line that divided the relatively cold and warm areas. In this wet belt, unprecedently heavy amounts of rain for May were reported from numerous stations and all time records for any month for some. Previous high May records were broken at Sandusky, and Toledo, Ohio; Detroit, Mich.; Indianapolis, Terre Haute, and Fort Wayne, Ind.; St. Louis, Springfield, and Columbia, Mo.; and Bentonville, Ark. The heaviest reported from a first-order station was 14.71 inches at Fort Smith Ark., the heaviest since 1899. Figure 2, based on nearly all reporting stations by State averages, shows that Indiana, Illinois, Missouri, and Arkansas had more than twice normal May rainfall. Indiana, Illinois, Missouri, and Oklahoma had the greatest of record; New York the greatest since 1894; Pennsylvania, since 1908; Michigan, since 1912; and Ohio, since 1933. In fact the State averages for Illinois, Indiana, and Missouri of 8.80, 8.72 and 9.86 respectively, have been exceeded only once in each case for any month--Illinois, September 1926; Indiana, March 1913; and Missouri, June 1928. The average for Oklahoma, 10.18,



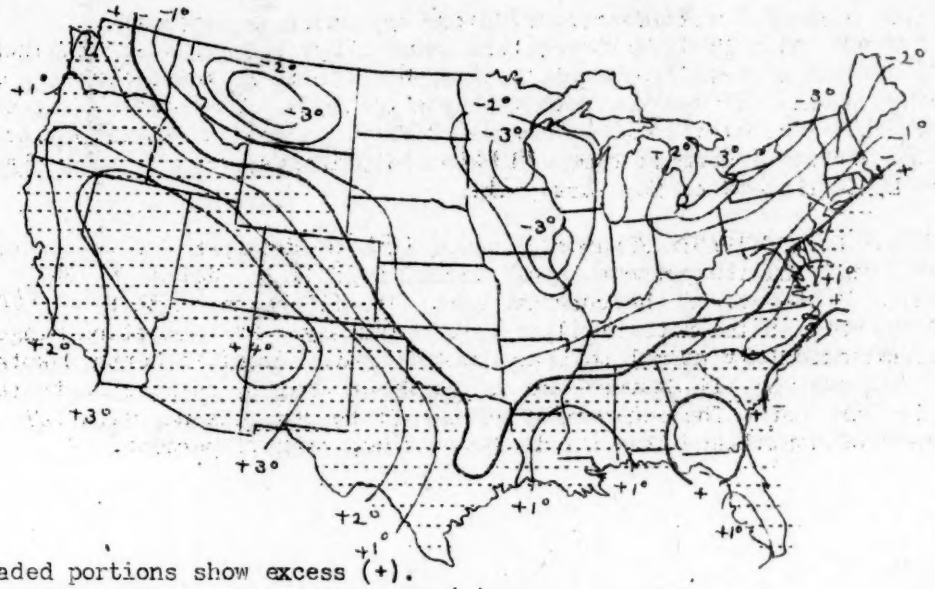
Shaded portions show excess (+).
Unshaded portions show deficiency (-)
Lines show amount of excess or deficiency

Fig. 1. Departure of Mean Temperature from Normal, May 1943



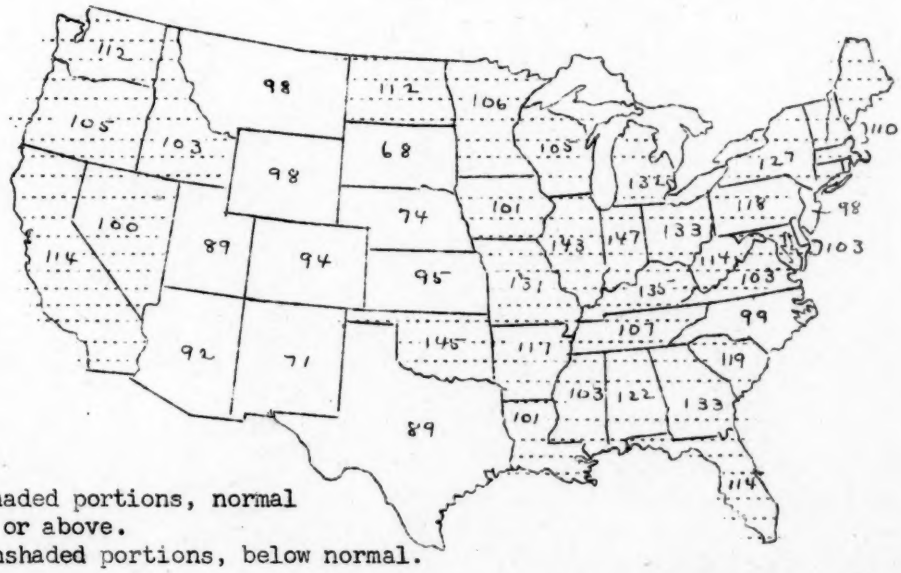
Shaded portions, normal or above.
Unshaded portions, below normal.

Fig. 2. Percentage of Normal Precipitation by States, May 1943



Shaded portions show excess (+).
Unshaded portions show deficiency (-).
Lines show amount of excess or deficiency.

Fig. 3. Departure of Mean Temperature from Normal, Spring, March - May, 1943



Shaded portions, normal or above.
Unshaded portions, below normal.

Fig. 4. Percentage of Normal Precipitation by States, Spring, March - May, 1943

is the highest heretofore recorded for any month in any year.

For the entire United States, the average May rainfall was 3.46 inches, 123 percent of normal, against 1.96 or 80 percent of normal for the preceding month. It was the wettest May since 1935. The country-wide accumulated precipitation from January to May, inclusive, was 11.58 inches, or 96 percent of normal, compared with 12.03 inches, or approximately normal, to the end of May last year.

THE SPRING OF 1943: Figures 3 and 4 show the departure of temperature from normal and the percentage of normal rainfall by States for the spring, March-May, of the current year. It will be noted that the spring temperature map is quite similar to that for May. Precipitation ranged from approximately normal to considerably above normal in North Dakota and Oklahoma and all States east of the Great Plains, as well as those in the far West. The relatively wettest State was Indiana, with 127 percent of normal and the driest, New Mexico, with 71 percent.